

## A broken tooth at 12.000 feet

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**SYNOPSIS**

In this short paper, one of the very rarely reported cases of dental barotraumas, called odontocrexia is reported. A single engine C-172 with no pressure cabin takes off from sea level and climbs up to 12000 feet in relatively short time. 23 year old PIC of the aircraft suddenly goes down with severe tooth pain and becomes incapacitated. His molar tooth breaks and falls apart mostly because of mistreatment.

Aircraft safely lands under control of by flying pilot and PIC's tooth is successfully restored.

This incident causes considerations upon aeromedical examinations and lack of understanding of basic gas laws.

**INTRODUCTION**

Boyle, surely was the vivid pioneer of what we have today. Although this statement is far from describing who Boyle was and what we have, the only simple explanation is this. Shortly after he formulated the weird then behavior of gases that for a fixed amount of any gas, pressure and volume are inversely proportional, came the Law, Boyle's law which ruled that the pressure and volume of a gas have an inverse relationship. Simple today as we immensely live under this law and are horrifyingly aware of it. Or, we are not to some extend?

With this paper we report one of the very rarely reported cases of dental barotraumas, called odontocrexia (Gunepin M, 2010), happened at relatively low altitude. The case is literary an incident in aviation as it caused "captain incapacity" with two reasonable suspects: Mr. Boyle and the dentist.

**THE CASE**

A 23 year old pilot in command of a C-172 took off at Antalya International Airport (70 feet MSL) with an experienced second seat. As an ATC of an

overcrowded air space, operator asked them to climb over transition altitude (10.000 feet) and clear approach courses as quickly as possible. Upon request, two pilots urged tiny non-pressurized single engine to maximum climb rate. Half the way, at about 8000 feet, PIC enunciated that he had severe and sudden tooth ache. By-flier asked to take over the controls but he had refused while they were about to be slightly over 10.000 feet. As the altitude was over 10000 feet and altitude change was high, By flier suspected oxygen deficiency and asked if it was head ache or tooth, how the PIC's sight was etc. The aircraft was not equipped with oxygen supplies so they stopped climbing at 12000 feet informing ATC. At that very moment, PIC writhed and left the controls holding his chin. He could hardly spoke and explained his agony so the by flier took over the controls and requested landing instructions. While PIC suffered seemingly severe pain, by flier safely descended and finally landed. As PIC insisted not to, they did not call for emergency medical help. On parking the aircraft, he headed for a dental clinic where he was diagnosed a quite case of odontocrexia: a large

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scale fracture on lower chin first molar tooth which needed an immediate dental attention and treatment. The moral of this case is that a tooth may well incapacitate a pilot on flight.

## DISCUSSION

The fractured tooth of this particular case had once been filled amalgam when decay had progressed beyond the earliest stage with no root canal treatment some years ago. Although there is little in the literature on dental restoration breakage in the aviation environment since reports of problems in combat aviators in War World II (Zadik, Einy, Pokroy, Dayan, & Goldstein, 2006), it is a known fact that Mr. Boyle may well project such bizarre. There are factors in this particular case for Mr. Boyle to involve. The filling material could have very slightly displaced leaving a small crevice from where air could travel in and got trapped. The same opening could have caused microorganisms to travel in and thrive under the filling excavating a larger room and deploying with gas produced by them. Debris could have trapped the gas in the cavity. All might have been possible due to inadequate personal teeth maintenance, former botched treatment, worn caused by time, overloading the tooth to its resistance etc. At any reason, there is a room inside the tooth and some trapped gas in this room. As it happened in our case, pilots took off from almost sea level and climbed up to 12000 feet within relatively short time. The change of ambient pressure was enough and fast for Mr. Boyle to expand the gas to such a point that vulnerable wall of the tooth or the amalgam cap was unable to resist and fractured leaving immense pain behind (Gunepin M, 2010). We are not sure after discussing the matter with the treating dentist (the dentist who had filled the tooth was someone else) whether it was a fault of former dentist or something else but deep secondary caries were found in the damaged tooth. Still pathophysiology and contributing factors of this particular odontocrexia is unknown. What we are sure is that a small innocent detail could have lead to an undesired situation when PIC went down with incapacity if there had not been a by flier.

## CONCLUSIONS

The tooth was successfully restored and pilot regained his health.

We certainly agree with all Zadik's statements that this is rare so it seems phenomenous: "Because hard-tissue tooth fracture during flight is a rare event, few flight surgeons or dentists are familiar with this phenomenon". We recommend regular dental examinations with careful assessment of previous dental restorations in aircrew subject to decompression (Zadik, Einy, Pokroy, Dayan, & Goldstein, 2006) (Zadik, 2009) (Zadik, Chapnik, & Goldstein, 2007). Our institute suggests all its employees to have their mouth health checked at least once in every 6 months. This is a rule. On the other hand, pilots being examined in certified health institutions are not examined for their mouth or teeth health. There is no legislation or obligation. Further, it is not a rare situation that we observe flight instructors or pilot candidates fly with annoying tooth ache. Dental health is an issue. We strongly suggest that Aeromedical Examiners are to insist on dental reports before releasing flight crew's health certificates.

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